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9. **Yorkshire Naturalists' Trust, Ltd.**
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NACADUBA OLLYETTI, A NEW SPECIES OF LYCAENID FROM CEYLON (LEPIDOPTERA)

By A. Steven Corbet.

British Museum (Natural History)

In a revision of the genus *Nacaduba* Moore (Corbet, 1938, *Trans. R. ent. Soc. Lond.* **87** : 134), I referred to a male from Ceylon under the name *N. sanaya*. The specimen in question was in a private collection and it was not possible to dissect it at that time. I believed that it represented a Ceylonese form of *N. sanaya* because it closely resembled the races of this species from the Philippines and Celebes. In the same paper, I drew attention to Ormiston's figure of the male genitalia of the "wet-season form of *N. pavana nabo*" (1924, *Butterflies of Ceylon*, plate vii, figure 3) which I could not recognize.

Recently I have been able to examine the long series of *Nacaduba* specimens from Ceylon in the collection of Mr. L. G. O. Woodhouse and among these were 6 males and 14 females of the butterfly alluded to above. Examination of the male genitalia has shown that this is the insect figured by Ormiston and that it is distinct from any known *Nacaduba* species.

The new species appears to be quite rare, for the British Museum had only a single male (with damaged abdomen) before Mr. Woodhouse kindly presented three males and two females. The female appears to be that figured in Woodhouse and Henry, 1942, *The Butterfly Fauna of Ceylon*, plate xvii, fig. 4, but a little uncertainty must remain regarding this sex until time can be found to investigate the female genitalia in the genus *Nacaduba*.

Nacaduba ollyetti sp. n.

Male. *Upper side.* Pale greyish blue, slightly shining, and with a distinct greenish hue in certain lights. The underside markings are faintly visible from above ; otherwise the upper side is unmarked except for a very narrow black marginal line in the tornal half of the hind wing.

Under side. Pale greyish brown, with the strigae narrower, whiter and more distinct than in *N. nabo sidoma* Fruhstorfer, although the arrangement of the markings appears to be exactly as in that subspecies.

Wing shape as in *sidoma* but the greenish-grey colour of the upper side immediately separates the male from *N. nabo* or any other Ceylonese species of *Nacaduba*. Forewing length, 13·0–15·5 mm. (15·0 mm. in holotype).

The *genitalia* differ from those of *N. nabo* in the smaller and straighter valva, on which the serrations are finer and confined to the distal end. The androconial scales are more elliptical than in *N. nabo*.

Female. *Upper side.* Shining clear blue, but appearing a dull lilac in a side light. The fore wing has a black border along the costa and termen which is not continued along the dorsum ; this border is of uniform width (about 2 mm. at vein 3), except in the apical area

where it is somewhat broader. The hind wing has a series of black submarginal spots, inwardly defined by a black sinuate line, and the costal area is black dusted.

Under side. Resembles *N. nabo sidoma* Fruhstorfer.

Forewing length, 13·0 mm.

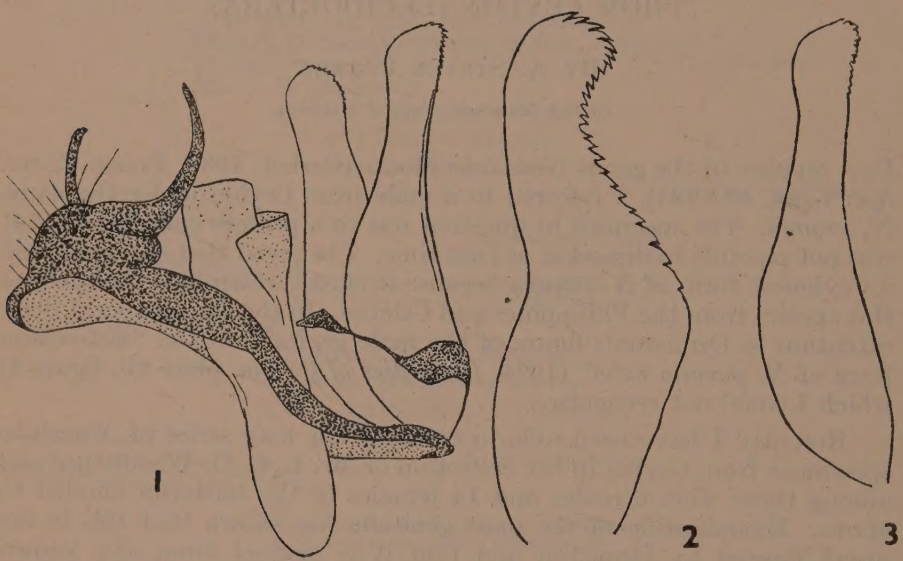


Fig. 1–3. (1) Male genitalia of *Nacaduba ollyetti* sp. n.; (2) Valva of *N. nabo sidoma* Fruhstorfer; (3) Valva of *N. ollyetti* sp. n. All from Ceylon. Figs. 2 and 3 are camera lucida drawings of the same magnification.

CEYLON : Kandy, 1–3000 feet, xii. 1939 (*L. G. O. Woodhouse*), 2 males, including the holotype (B. M. Rhop. type No. 15077) ; Kandy, v. 1943 (*O. S. Wickwar*), female ; Morawaka, ix. 1927 (*L. G. O. Woodhouse*), male ; Morawaka, iii. 1927 (*L. G. O. Woodhouse*), female allotype (B. M. Rhop. Type No. 15078).

I am glad to associate the name of this interesting species with that of Mr. L. G. Ollyett Woodhouse.

OBSERVATIONS ON SPECIES OF *NACADUBA* MOORE, AND SOME OTHER LYCAENIDAE FROM CEYLON

By L. G. O. Woodhouse.

In our book, *The Butterfly Fauna of Ceylon*, published by the Ceylon Government in 1942, Mr. G. M. R. Henry and I attempted to collate, chiefly for the keen amateur lepidopterist, the information so laboriously collected for, and so carefully recorded by, Dr. F. Moore, L. de Nicéville, Colonel C. T. Bingham, Major N. Manders, Messrs. F. M. Mackwood, W. Ormiston, as well as many others, including such an eminent authority as Mr. E. E. Green.

Since my retirement from Ceylon in 1943, I have labelled and arranged my collection of approximately 10,000 Ceylon butterflies, from the study of which, together with the expert knowledge and advice so readily and kindly given to me by Brigadier W. H. Evans, C.S.I., C.I.E., D.S.O., Captain N. D. Riley and Dr. A. S. Corbet, I have been able to add considerably to the butterfly lore of Ceylon. I would also like to record here what invaluable help the late Mr. O. S. Wickwar, the late Major L. H. C. Waldock and the late Captain J. N. Corlett, M.C., always gave me, particularly with rare specimens.

I am also greatly indebted to the Rev. Father Desmond P. Murray, the author of an excellent monograph on South African Lycaenidae. His dissections and drawings of the genitalia of the Ceylon Lycaenidae, particularly of species of *Nacaduba*, have been most helpful.

The object of this paper, which is written as an addendum to the book, is not only to include a new species of Ceylon *Nacaduba* (all of which, I believe, have been identified now) and a *Horaga* not previously known from Ceylon, but also to indicate the progress that has been made in our knowledge of the Lycaenidae of Ceylon since the publication of the book four years ago.

The Ceylonese species of *Nacaduba* fall conveniently into three groups, as characterized below :—

Pavana group : Fore wing underside basal area without white strigae ; tailed.

N. pactolus ceylonica Fruhstorfer.
N. nabo sidoma Fruhstorfer.
N. ollyetti Corbet.

Berenice group : Fore wing underside with white strigae on basal area ; tailed.

N. kurava prominens Moore.
N. sinhala Ormiston (=*ceylonica* Fruhstorfer, *praeocc.*).
N. beroë minima Toxopeus.
N. calauria toxopeusi Corbet (=*evansi* Toxopeus, *praeocc.*).
N. berenice ormistoni Toxopeus.

Nora group : Underside spaces between strigae darkened. Only *nora*-tailed. The 3 smallest Ceylon *Nacaduba.*

N. nora ardates Moore (= *kodi* Evans).
N. dubiosa indica Evans.
N. noreia noreia Felder.

Two other species, *Ionolyce helicon viola* Moore and *Petrelaea dana adima* de Rhé-Philipe, have hitherto been included in the genus *Nacaduba.*

Nacaduba pactolus ceylonica Fruhstorfer.

Vide Plate XVII, figs 1 and 2[1]. The strigae are broad, diffuse and continuous and are on an ochreous-brown background. This is the only Ceylon *Nacaduba* with white-tipped antennae. The genitalia are shown in fig. 1 of the accompanying plate. Although there is comparatively little variation in size, pattern and colour amongst my series of 38 males and 36 females (of which 5 pairs were taken *in coitu*), there is a distinct seasonal female form, the dark markings being heavier on the upper sides of both wings in the wet season form.

Nacaduba nabo sidoma Fruhstorfer (=*hermus nabo* Fruhstorfer ; Evans).

Only the male is illustrated on Plate XVII, fig. 3. The strigae are narrow, clearly defined, straight and conjoined compared with *pactolus.* The genitalia are shown in fig. 2 of the accompanying plate. The veins on the upper sides of both wings in the females are not clearly marked, as in *pactolus,* and both fore and hind wings are more heavily shaded in the wet season form. In my series of 48 males and 14 females there is much more variation in size amongst the males than in *pactolus :* and in the dry season form, of both sexes, on the hind wing under sides the markings are obscured by a clouded discal patch, which varies in size.

Nacaduba ollyetti Corbet.

This new species has been described in the preceding paper by Dr. A. S. Corbet.

This appears to be a rare butterfly as only 0·8 per cent. of all the Ceylon male *Nacaduba*—and I have 721—were *ollyetti.*

Only the female is illustrated on Plate XVII, fig. 4. The genitalia are shown in fig. 3 of the accompanying plate. The males can be separated from any other Ceylon *Nacaduba* by the greenish tinge on the upper sides ; in fact, although this had been noticed, it had been assumed that the specimens had been left too long in the cyanide poison bottle : and it had also been assumed that the males were the dry season form of *nabo,* which are more heavily marked. I have a series of 6 males and 14 females.

Nacaduba kurava prominens Moore.

Vide Plate XVII, figs. 9 and 10. The apex of the male fore wing is pointed and both wings are transparent, the prominent strigae showing through from below : in the females, these strigae are much broader and

[1] These references are throughout to Woodhouse and Henry, 1943, *The Butterfly Fauna of Ceylon.*

more diffused ; and the blue on the male upper sides is lighter than in any other Ceylon *Nacaduba*, except *sinhala*. The genitalia are shown in fig. 4 of the accompanying plate. In my series of 81 males and 37 females I have one pair taken *in coitu*. Although the female dry season form is not so heavily marked as the wet season form, there is little other variation in size, pattern and coloration of either sex. I have only one dwarf male, and one male aberration with very irregular strigae.

Nacaduba sinhala Ormiston (=*ceylonica* Fruhstorfer *praeocc.*).

Vide Plate XVII, figs. 5 to 8. The apex of the male fore wing is rounded and both wings are transparent, the prominent strigae (broader and more conspicuous than in *prominens*) showing through from below. The females of *sinhala* and *prominens* are very similar but, on the average, *prominens* is the larger and the discal areas on the fore wing upper sides are a much paler shade of blue in *sinhala* than in *prominens* female. The genitalia are shown in fig. 5 of the accompanying plate. In my series of 132 males and 119 females, I have 6 pairs taken *in coitu*. Although there is little seasonal variation, *sinhala* varies more in size and pattern, in both sexes, than any other Ceylon *Nacaduba*. I have some amazing aberrations of both sexes, particularly in the underside markings.

Nacaduba beroe minima Toxopeus.

Vide Plate XVII, figs. 13 and 14. The wings are opaque and in fresh male specimens the upper sides are a shining dark royal purple, more gorgeous in the right light than in any other Ceylon *Nacaduba*. In the female, the purple discal areas on the fore wings are more restricted than in *calauria* females. The genitalia are shown in fig. 6 of the accompanying plate. In my series of 124 males and 109 females, I have 18 pairs taken *in coitu* : but except for the variation in size of the purple discal areas on the fore wings of the females, there is a remarkable consistency in size and pattern in comparison with other Ceylon *Nacaduba*.

Nacaduba calauria toxopeusi Corbet (=*evansi* Toxopeus *praeocc.*).

Not illustrated. The males are not so brilliant above as *beroe*, and the wings of *calauria* are very slightly transparent : but, except in the freshest specimens, it is impossible to distinguish *calauria* from *beroe* without dissection of their genitalia, which are shown in fig. 7 of the attached plate. In *calauria* females not only are the purple discal areas, on both wings, more extensive than in *beroe* females, but in the fore wings extend on an even curve to the termen. In my series of 28 males and 20 females, I have 6 pairs taken *in coitu*. I can detect no seasonal variation in the males, but the brilliant purple discal areas on both fore and hind wings of the females are so much more extensive in the dry season form that I first thought they might be a different subspecies ; I had two pairs taken *in coitu*, but the dissection of the male genitalia proved they were a seasonal form and the only difference in the female is the comparatively large expanse of purple discal areas.

Nacaduba berenice ormistoni Toxopeus.

Vide Plate XVII, figs. 11 and 12. The apex of the male fore wing is rounded, the wings are slightly transparent and of a different colour from *beroe* or *calauria*. The upper side discal areas of *berenice* females are *blue* and not purple as in *beroe* and *calauria*. The genitalia are shown in fig. 8 of the accompanying plate. In my series of 110 males and 116 females, I have 8 pairs taken *in coitu*: and although I have one remarkable aberration, there is surprisingly little variation in size and the pattern of the strigae in either sex. In the males, however, there is remarkable seasonal variation in colour, the extreme dry and wet season forms being respectively rather a dull slaty blue and a glossy purple, but not as intense as in the gorgeous male *beroe*. The blue discal areas, in both fore and hind wings of *berenice* females, vary in size even more so than do the purple areas in the seasonal forms of *calauria* females: and here again I first thought they might be a different subspecies; I had 2 pairs taken *in coitu*, but the dissection of the male genitalia proved they were a seasonal form; and the only difference between the females is the much larger light blue discal areas on both fore and hind wings, which, with much lighter markings along the termens, give the dry season form a strikingly distinct appearance.

Nacaduba nora ardates Moore (=*kodi* Evans).

Vide Plate XVII, figs. 25 to 28. The genitalia are shown in fig. 10 of the accompanying plate. In my series of 78 males and 78 females, I have 1 pair taken *in coitu*. A most variable insect, in both sexes, particularly as regards the pattern on the under sides; so much so that Toxopeus separated *N. nora* into 5 subspecies. Ormiston has recorded that he had never seen the variety of the female with the yellow under side without tails: I do not know how many hundreds of specimens he examined, but I have checked his statement with hundreds more and can endorse its accuracy.

Nacaduba dubiosa indica Evans.

Vide Plate XVII, figs. 29 and 30. The cilia at the apex of the fore wings are not white. The genitalia are shown in fig. 11 of the accompanying plate. In my series of 69 males and 19 females, I have one pair taken *in coitu*.

Nacaduba noreia noreia Felder.

Only the male is illustrated in Plate XVII, fig. 31. The cilia at the apex of the fore wings are white: but if a specimen is old or worn, both sexes can be distinguished at once from *indica* as the basal band, on the fore wing undersides, formed by the strigae, is confined to the cell, and not extended almost to the dorsum, as in *indica* and *ardates*. The genitalia are shown in fig. 12 of the plate attached. I have a poor series of 7 males and 1 female. The purple-brown of the male upper sides is brighter and of quite a different shade from the male of *indica* or *ardates*. In some female *noreia*, I understand there are bright blue patches on the discal areas of both fore and hind wings.

Ionolyce helicon viola Moore.

Vide Plate XVII, figs. 22 and 23. Hitherto, this has been included in the genus *Nacaduba*. In my series of 35 males I have been unable to secure a female, the only one which I have ever seen was given to me by the late W. Ormiston and I used it for the illustration in fig. 23.

Petrelaea dana adima De Rhé Philippe.

Only the male is illustrated in Plate XVII, fig. 24. Hitherto this had been included in the genus *Nacaduba*. The female upper sides are heavily shaded and the blue discal areas vary slightly in size, especially on the fore wings. Both sexes can be identified by the two small plain black spots of nearly equal size by the tornus on the hind wing under sides : in *N. indica* and *N. noreia* there is a much larger spot, crowned with orange and metallic green scales. I have a series of 23 males and 4 females.

Celastrina puspa felderi Toxopeus and *Celastrina lilacea* Hampson.

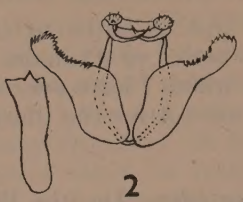
Vide Plate XVI, figs. 15 to 18. Are these two species really the extreme seasonal forms of one and the same species ? For various reasons they have been referred to several genera—*Acytolepis*, *Polyommatus*, *Cyaniris*, *Lycaenopsis*, etc. In 1880, Moore figured a male of what I now believe is the dry season form as the female of *puspa* (*The Lepidoptera of Ceylon*, 1:75, Pl. 34, figs. 6, 6a, 7). In my series of 75 males and 59 females, I have two pairs taken *in coitu*, but both are *puspa*, of what I now believe is the wet season form. The Rev. Father D. P. Murray has dissected the genitalia of 6 picked male specimens and all appear to be similar—*vide* fig. 9 of the accompanying plate. The difference in the 59 females is not more than would be expected between the wet and dry season forms, which, in Ceylon, fly together all the year round : but the difference in the 75 males is so much more pronounced that what I now believe to be the extreme dry season form, with its rounded and more heavily shaded wings, might be mistaken for a female.

Following Evans, in *The Butterfly Fauna of Ceylon* we recognized two species, *Lycaenopsis puspa felderi* Toxopeus and *L. lilacea* Hampson, which were separable by several apparently constant differences, including the more prominent white discal patches on the upper sides of both wings in the males of *puspa*. Although most specimens of these forms can be separated into two series in both sexes, there are numerous intergrades which led me to believe they are all one species in Ceylon. Dr. A. S. Corbet has drawn my attention to the fact that Toxopeus apparently came to the same conclusion (Toxopeus, L. J., 1930, *De Soort als Functie van Plaats en Tijd* : 142).

It may be mentioned that *lilacea* Hampson was described from the Nilgiri Hills in S. India, and so this name must be reserved for the South Indian race. Toxopeus' name *moorei* is founded on Ceylon examples, so that the correct name for the Ceylon race of *Celastrina puspa* is *C. puspa moorei* Toxopeus.

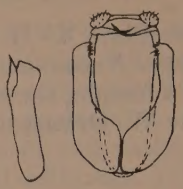
1

N. pactolus ceylonica Fr.



2

N. nabo sidoma Fr.



3

N. ollyetti Cbt.

4

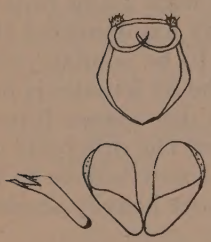
N. kurava prominens M.

5

N. sinhala O.

6

N. beroë minima Tox.

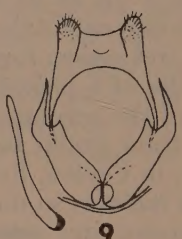


7

N. caluria toxopeusi Cbt.

8

N. berenice ormistoni Tox.



9

Celastrina puspa felderi Tox.
do. lilacea Hamp.

10

N. nora ardates M.

11

N. dubiosa indica E.

12

N. noreia noreia Fd.

Male genitalia of Ceylonese *Nacaduba*.

Horaga albimacula viola Moore.

Vide Plate XX, fig. 22. Although this butterfly has not been recorded from Ceylon before, and I have only two specimens of it, I have seen worn specimens in the Colombo Museum and in the late W. Ormiston's collection in Galle. We then thought they might be melanisms of *H. onyx cingalensis* until the late O. S. Bird, of the Ceylon Survey Department, captured several at Kandy in January and February, 1937, one of which the late Lord Rothschild identified for me at the Tring Museum, where there is a series of twelve, ten from Sikkim and two from the Northern Himalayas : captures have also been recorded from the Nilgiris, Burma and Malaya, so, though rare, the insect has an extensive range.

Dr. Moore first described it in 1882, *Proc. zool Soc. Lond.* 1882 : 248, and in 1911–1912, *Lepidoptera Indica* 9 : 11–12, Plate 707, the male is correctly figured, but there appears to be some mistake in the picture of the female. De. Nicéville (Vol. III, page 419) gives the best description that I can find, pointing out that the male *viola* does not possess the "male mark" on the under side of the fore wing, which is usually present in this genus : and both sexes are alike in coloration.

TWO NEW GENERA OF THE TRIBE *PODISMINI* (ORTHOPTERA, ACRIDIDAE) FROM THE OLD WORLD

By Leo Mistshenko.
(*Leningrad*).

(With two text-figures).

The present paper is the result of a study of the materials of the tribe Podismini in the Zoological Institute of the Academy of Sciences, U.S.S.R., Leningrad.

1. **Parapodisma** gen. n.

Podisma Scudder, 1897, *Proc. U.S. nat. Mus.* **20** : 12, 94 (*partim*).
Miramella Dovnar-Zapolskij, (1932) 1933, *Trav. Inst. Zool. Acad. Sci. U.R.S.S.* 1 : 255, 258, 262, 266 (*partim*).
Miramella Tinkham, 1936, *Trans. nat. Hist. Soc. Formosa* **26** : 404 (*non* Dovnar-Zapolskij.).
Odontopodisma Ramme, 1939, *Mitt. zool. Mus. Berlin* **24** : 140, 141, 143 (*partim*).
Miramella Tinkham, 1940, *Ling. Sci. J.* **19** : 320 (*partim*).

Body with sparse hairs, slender.

Eyes large, irregularly-oval ; vertical diameter of the eye almost 1·5 times its horizontal one and in male almost 1·5 times the length of the subocular furrow, in female, equal to it. Frons distinctly sloping. Frontal ridge distinctly impressed, almost parallel-sided, obliterated at the clypeus, coarsely punctured at the apex of the vertex ; in profile weakly prominent at the bases of the antennae ; margins distinct, rounded. Facial keels distinct. Vertex weakly impressed, without any median keel ; width of the vertex between the eyes in male is equal to that of the frontal ridge between the antennae, in female, scarcely larger than this width ; margins very weakly raised, almost obliterated ; fastigium very strongly sloping, almost vertical. Temporal foveolae very indistinct, punctured. Occiput finely punctured, weakly convex. Antennae thin, 23-24 jointed, in male extending beyond the posterior pronotal margin, in female only reaching this margin.

Pronotum long, gradually expanded towards the posterior margin ; in profile weakly

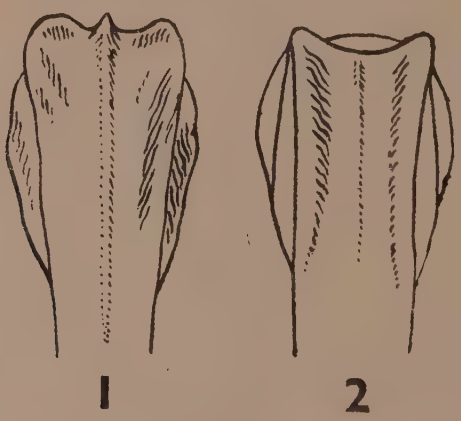


Fig. 1. *Parapodisma mikado* (I. Bolívar). Dorsal view of the apex of the male hind femur.
Fig. 2. *Miramella solitaria* (Ikonn.). Dorsal view of the apex of the male hind femur.

convex ; prozona minutely and densely punctured, its length 1·25–1·75 times that of the metazona ; two anterior furrows weak, posterior furrow always distinct, crosses the median keel and extends far behind the middle of the pronotum ; metazona coarsely and densely punctured and distinctly wrinkled ; median keel weak, hardly noticeable in the prozona ; lateral keels absent ; anterior margin almost straight, hardly excised at the median keel ; posterior margin rounded. Lateral pronotal lobe trapezoidal, narrowed towards the lower margin, coarsely and densely punctured and distinctly wrinkled in the posterior part ; anterior margin weakly undulating ; anterior and posterior lower angles obtuse, very weakly rounded ; posterior margin oblique, weakly excised ; lower margin strongly bi-sinuated. Mesonotum wholly covered by the pronotum. Metanotum minutely and densely punctured.

Prosternum with a pointed conical tubercle. Elytra lateral, strongly abbreviated, reaching the first or the second abdominal tergite. Wings hardly noticeable. Front and middle femora in male weakly swollen. Hind femora slender, fairly long ; upper margin of the femur smooth, with an acute apical spine (fig. 1.). Hind tibia scarcely shorter than the hind femur, rounded ; inner pair of the spurs longer than the outer ones. Arolia between the tarsal claws large, reaching the apices of the claws. The first joint of the hind tarsus is slightly shorter than the third.

Abdomen punctured ; median keel weak ; the first tergite with a large open tympanal organ. Male, last tergite bisected in the middle, without any furcula on the posterior margin. Supra-anal plate in male triangular or almost trapezoidal, with two weak, or distinctly elevated, longitudinal wrinkles at the middle of the posterior margin and with a longitudinal median impression at the base ; in female triangular, smooth, with a longitudinal median impression at the base. Cercus in both sexes short, not reaching the apex of the supra-anal plate ; its profile in male variable, in female, pointed. Subgenital plate in male conical, its apex generally distinctly attenuated ; in female oblong, with a distinct median triangular projection on the posterior margin. Valvae of the female ovipositor short, with pointed apices ; valva without any apical teeth ; outer upper margin of the upper valva and outer lower margin of the lower valva with a few small teeth.

Type of the genus : *Pezotettix mikado* I. Bolívar, Japan.

The following species are referable to the genus *Parapodisma* : *Pezotettix mikado* I. Bolívar, 1890 ; *Podisma formosanum* Shiraki, 1910 ; *P. kodamae* Shiraki, 1910 ; *P. kowakamii* Shiraki, 1910 ; *Miramella splendida* Tinkham, 1936 ; *M. shirakii* Tinkham, 1936 ; *Podisma lofaoshana* Tinkham, 1936. I provisionally included in this genus also : *Pezotettix fauriei* I. Bolívar, 1890 ; *Podisma sapporense* Shiraki, 1910 ; and *P. subaptera* Hebard, 1924.

On the one hand, the genus *Miramella* Dovnar-Zapolskij, 1933, is very close to the genus *Parapodisma*, while on the other, the latter is very closely related to the genus *Niitakacris* Tinkham, 1936. The genus *Parapodisma* differs from *Miramella* by the presence of the apical spine on the upper keel of the hind femur (fig. 1), the absence of the furcula on the last male abdominal tergite and pointed apices of the valvae of the female ovipositor ; it differs from *Niitakacris* by the shape of the pronotum, which is narrow and convex, with its posterior margin rounded, the absence of the lateral pronotal keels and of the furcula on the last male abdominal tergite.

2. **Pseudopodisma** gen. n.

Pezotettix Frivaldskij, 1867, *Monographia Orthopterorum Hungariae* : 136, 169 (*partim*).
Podisma Scudder, 1897, *Proc. U. S. nat. Mus.* **20** : 12, 94 (*partim*).

Odontopodisma Dovnar-Zapolskij, (1932) 1933, *Trav. Inst. Zool. Acad. Sci. U.R.S.S.* I : 255, 258, 262, 265 (*partim*).

Odontopodisma Ramme, 1939, *Mitt. zool. Mus. Berlin* 24 : 140, 141, 143 (*partim*).

Body with sparse hairs, slender.

Eyes rather large, irregularly-oval ; vertical diameter of the eye is almost 1·5 times its horizontal one and almost equal to the length of the subocular furrow. Frons weakly sloping. Frontal ridge weakly impressed, almost parallel-sided, sometimes weakly dilated between the antennae, obliterated at the clypeus, coarsely punctured at the apex of the vertex ; in profile very weakly projecting at the bases of the antennae ; margins distinct, rounded. Facial keels distinct. Vertex weakly impressed, without any median keel ; width of the vertex between the eyes in both sexes is almost 1·75 times that of the frontal ridge between the antennae ; fastigium of the vertex very strongly sloping, almost vertical. Temporal foveolae very indistinct. Occiput minutely punctured, weakly convex. Antennae thin, 23-24 jointed, long, in male extending beyond the posterior pronotal margin, in female only reaching this margin.

Pronotum long, weakly and gradually expanded towards the posterior margin, in profile weakly convex ; prozona minutely and densely punctured, its length is 1·75–2 times that of the metazona ; two anterior furrows weak, posterior furrow always distinct, always crosses median keel and extends far behind the middle of the pronotum ; metazona coarsely and densely punctured and minutely wrinkled ; median keel weak, hardly noticeable in the prozona ; lateral keels absent ; anterior margin almost straight, hardly excised at the median keel ; posterior margin weakly rounded, sometimes very weakly excised at the median keel. Lateral pronotal lobe trapezoidal, narrowed towards the lower margin, coarsely and densely punctured and minutely wrinkled in the posterior part ; anterior margin weakly undulating ; anterior and posterior lower angles obtuse, rounded ; posterior margin strongly bi-sinuated. Mesonotum wholly covered by the pronotum. Metanotum minutely and densely punctured ; median keel hardly noticeable.

Prosternum with a pointed conical tubercle.

Elytra lateral, strongly shortened, reaching the second abdominal tergite. Wings hardly noticeable. Front and middle femora in male weakly swollen. Hind femora slender ; upper margin of the femur smooth, without any spine on the apex. Hind tibia is slightly shorter than the hind femur, rounded ; inner pair of the spurs is longer than the outer one. Arolia between the tarsal claws large, reaching the apices of the claws. The first joint of the hind tarsus is almost equal to the third.

Abdomen punctured ; median keel weak ; the first tergite with a large open tympanal organ : the last male tergite bisected in the middle, without any furcula on the posterior margin. Supra-anal plate in male triangular, with two triangular projections at the middle of the lateral margins, with two longitudinal wrinkles at the middle of the posterior margin and with a longitudinal median impression at the base ; in female triangular, smooth, with a longitudinal median impression at the base. Cerci in male reaching the apex of the supra-anal plate ; cercus in profile constricted at the middle and dilated towards the base and the apex ; in female, short, not reaching the apex of the supra-anal plate, in profile, pointed. Subgenital plate in male conical, its apex obtusely-pointed ; in female, oblong, with a distinct median triangular projection on the posterior margin. Valvae of the female ovipositor short, with pointed apices ; valva without any teeth on the apex ; upper valva weakly excised, with few small teeth on the outer upper margin ; lower valva with a distinct tooth on the outer lower margin.

Type of the genus : *Podisma fieberi* Scudder, 1897, Central Europe.

This new monotypical genus is very nearly related to the genus *Podisma* Berthold, 1827, differing from it by the shape and structure of the pronotum and the absence of the furcula on the last male abdominal tergite.

ETHIOPIAN CULICIDAE—THE DESCRIPTION OF A NEW *ERETMAPODITES* THEOBALD

By E. C. C. van Someren.

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Specimens of an *Eretmapodites* Theobald collected in the Kaimosi Forest, Kenya Colony, and referred to as *Eretmapodites* sp. indet. by Garnham, Harper and Highton (1946) have, on closer examination, been found to represent a hitherto undescribed species, a description of which is given below.

Fig. 1.—Male terminalia of *E. hightoni* sp. n.

Eretmapodites hightoni sp. n.

This species is very similar to *E. dracaenae* Edwards (1941) and also resembles *E. ferox* Haddow (1946). The only external character which may serve to separate *hightoni* from *ferox* is the colour of the sheen on the silvery lateral patches of the abdomen, but this should be used with caution. All the silvery abdominal markings of *ferox* have a very noticeable pinkish-purple sheen, and, although a few shining pink scales may be present in the abdominal silvery markings of *hightoni*, these markings

are usually metallic silver or silvery with a predominant blue sheen which outshines any faint pink colour which may be present. It is probably not possible to separate *hightoni* and *dracaenae* except by dissections of the male terminalia.

Adult female. As *dracaenae*, but like *ferox* the markings on the scutum are variable with the lateral yellow lines sometimes stopping short at a half, sometimes curving out to the scutal angle in a broad or narrow band of yellow scales. The median dark stripe may or may not be divided by a narrow line of yellow scales and the breadth of the dark lines varies. The abdomen has no dorsal silvery markings on the first tergite, but all tergites have silvery lateral patches which, on tergites 1–7, sometimes have a blue sheen ; this is more noticeable on tergites 6 and 7 which may also have a few pinkish scales. One specimen had a few pink scales in all silvery lateral patches but the pink sheen is never so well marked as that seen on *ferox*, and the blue sheen predominates. Tergite 7 and sometimes 6 with complete silvery bands. Sternites 2–3 all yellow, 4 with a small median apical patch of black scales, 5–7 with broad apical bands of black scales which are roughened as in *dracaenae*. Legs as in *ferox*, black, with all femora extensively yellow at the base and with a varying extent of yellow ventrally. Hind and mid femora with small but conspicuous white knee-spots. Fore and mid tibiae yellow ventrally, hind tibiae with a narrow inconspicuous yellow line on the mid one-third posteriorly. The tarsi sometimes have a narrow ventral yellow stripe.

Adult male. As the female. Additional characters to be noted are, tergite 7, sometimes 6, and very occasionally 5 also, with complete silvery bands ; sometimes the silvery bands are absent from all tergites. Sternite 4 usually with a broad apical black band. *Terminalia* (fig. 1). Similar to *dracaenae* and *ferox* but easily separated from either by the huge hairy distal claspette which in tergal views covers the coxite. The coxite is very short and round and bears on the external border a very long stout hair which rises below a half, and a few scales and short hairs on the basal half of the outer margin. The style is curved and tapering with a fair number of scales and hairs at the middle. The apical lobe is prominent and bears a number of simple hairs on prominent tubercles ; viewed laterally it often appears bifid, but the shape of this lobe varies from different angles. The basal lobe is very like that described for *ferox* and may be short or long, depending on the position of the mount, but it is most often seen as a long stout arm ; there is a patch of short simple bristles at the apex of this lobe behind which there is a row of 4 spoon-shaped scales and a patch of battledore type hairs and in front there is a row of 15 sigmoid hairs with harpoon-like terminations. The distal claspette is large and rises from the base of the coxite. It consists of a stout stalk, hinged to the coxite, and a large apical disc which is densely covered with numerous modified hairs of the battledore type and has a small patch of simple hairs on the basal border. There is no proximal claspette. When the terminalia are viewed from the tergal aspect the distal claspette is the most conspicuous character as it covers the coxite, leaving only the tips of the apical and basal lobes uncovered.

Note.—The battledore type hairs of the basal lobe and distal claspette assume various shapes, but when they are lying flat they are seen to consist of a delicate stalk expanded on the apical third into a disc which is finely fringed round the apex. Sometimes, however, these hairs appear only slightly swollen at the tip and deeply dentate, or as slender hairs delicately feathered on the apical third. This is due to the fact that in balsam mounts the hairs are very often twisted so that the flat apical disc is folded or seen edge on.

Described from the holotype, allotype, 40 female and 46 male paratypes, collected by Dr. P. C. C. Garnham, Mr. J. O. Harper, and Mr. R. B. Highton, Medical Department, Kenya, in the Kaimosi Forest, Kenya Colony.

Key to the known Eretmapodites *females. Haddow* (1946).

At the end of the first alternative of section 12 after *ferox* sp. n. add "and *hightoni* sp. n."

Key to the known Eretmapodites *males. Haddow* (1946).

Delete section 18 and substitute :—

18. Basal lobe without sigmoid hairs ; distal claspette with a patch of short, enlarged-tipped hairs below and a few long simple hairs above . . . . *dracaenae* Edwards
Basal lobe with a terminal row of sigmoid hairs with harpoon-shaped tips ; hairs of distal claspette not as above . . 18a

Add a new section as follows :—

18a. Enlarged tip of distal claspette large and conspicuous (greatest width equal to the length of the coxite) and densely covered with delicate enlarged-tipped hairs . . **hightoni** sp. n.
Enlarged tip of distal claspette small and inconspicuous (greatest width equal to about half the length of the coxite) and with a patch of short simple hairs below and a few long, distally serrated hairs above . . *ferox* Haddow

REFERENCES.

Edwards, F. W., 1941, *Mosquitoes of the Ethiopian Region.* 3.

Garnham, P. C. C., Harper, J. O., and Highton, R. B., 1946, The Mosquitoes of the Kaimosi Forest, Kenya Colony, with Special Reference to Yellow Fever. *Bull. ent. Res.* **36** : 473–496.

Haddow, A. J., 1946, The Mosquitoes of Bwamba County, Uganda : IV. Studies on the Genus *Eretmapodites* Theobald. *Bull. ent. Res.* **37** : 57–82.

THE GENUS *COPHAPHONUS* TARBINSKIJ (ORTHOPTERA, GRYLLIDAE)

By Leo Mistshenko.

(*Leningrad*).

As the result of studying the genus *Cophaphonus* Tarbinskij, in the Zoological Institute of the Academy of Sciences of the U.S.S.R., Leningrad, it has emerged that at the present moment the genus includes four species, three of which are new.

The genus *Cophaphonus* Tarbinskij is very close to the genus *Conoblemmus* Adelung, 1910, from which it differs in the absence of frontal projection and by the sparse venation of the male elytron.

The distribution area of the genus *Cophaphonus* covers Southern Kazakhstan, Uzbekistan and Western Turkomania in Middle Asia.

Cophaphonus Tarbinskij.

Cophaphonus Tarbinskij, 1932, *Bull. Leningrad Inst. Cont. Farm Forest Pests* 2 : 196

Body with dense short hairs.

Width of head is equal to, or hardly greater than, the width of pronotum. Eyes small, shortly-oval ; the horizontal diameter of the eye is equal to the distance from the anterior margin of the eye to the apex of the frons ; anterior margin rounded. Ocelli absent. Frons in male flat, broad, in profile concave ; in female in profile weakly rounded, weakly projecting forwards ; lower limit of the frons straight, distinct throughout. Vertex rounded, weakly sloping. Facial keels in male distinct, in female almost obliterated. Pronotum trapezoidal, distinctly narrowed towards the posterior margin ; its maximum width is distinctly greater than its maximum length. Lateral pronotal lobes trapezoidal, narrowed towards the lower margin; anterior and posterior margins almost straight; anterior lower angle acutangular, rounded ; posterior lower angle obtuse, broadly-rounded ; lower margin almost straight, obliquely ascending from the anterior lower angle to the posterior lower one. Meso- and metasternal episternum with a distinct pointed tooth on the posterior margin. Posterior margin of the mesosternal epimeron with a distinct rounded notch at the lower margin. Elytra in male strongly shortened, lobe-shaped ; elytron without sound organ and with indistinct sparse venation in the dorsal part ; in female lateral, scale-shaped. Wings absent.

Front tibia without any foramen of the tympanal organ on either side. Front tarsi short ; the first joint of the tarsus thick, almost equal to the third one. Hind tibia thick, constricted laterally, rounded in the basal part and flattened between the spines, upper side of the hind tibia with two rows of spines; spines thick, immobile, with short hairs. The first joint of the hind tarsus laterally constricted ; margins of the upper side with short thick spinules.

Supra-anal plate in both sexes with a distinct longitudinal median impression ; posterior margin rounded. Cerci in both sexes long ; cercus almost reaching the middle of the hind tibia, if the latter is extended straight backwards. Subgenital plate in male with a notch on the apex ; in female trapezoidal, small, narrowed towards the apex. Female ovipositor almost straight ; its lower margin hardly concave.

Type of the genus: *Cophaphonus zimini* Tarbinskij, Uzbekistan (U.S.S.R., Middle Asia).

Key to the species.

1 (2). Outer upper margin of the female hind tibia with 2 spines (male unknown). Female ovipositor very short; its length less than half that of the hind femur. W. Turkomania
1. **C. riparius** sp. n.

2 (1). Outer upper margin of the hind tibia in male with 3–4 spines, in female with 4–5 spines. Female ovipositor long; only slightly shorter than of the hind femur.

3 (4). Head in both sexes small; its maximum width equal to that of the anterior pronotal margin. Pronotum in both sexes not narrowed towards the posterior margin. S. Kazakhstan
2. **C. privatus** sp. n.

4 (3). Head in both sexes large; its maximum width considerably larger than that of the anterior pronotal margin. Pronotum in both sexes distinctly narrowed towards the posterior margin.

5 (6). Frons in both sexes with a dark bow-shaped stripe above the antennae; stripe not reaching the dark spots between the antennae near internal margins of the antennal cavities. Pronotum in both sexes with a pale median longitudinal stripe above. Male lateral pronotal lobes with a dark spot near the posterior margin. Three first anterior longitudinal veins of the male elytron straight. Upper side of the first joint of the hind tarsus in male with 8 spinules on the outer, 7 spinules on the inner margin; in female with six spinules on both margins. C. Uzbekistan . 3. *C. zimini* Tarbinskij.

6 (5). Male frons (female unknown) with a dark bow-shaped stripe above the antennae; stripe reaching the dark spots between the antennae near internal margins of the antennal cavities. Male pronotum without pale median longitudinal stripe above. Male lateral pronotal lobes with a dark spot near the anterior margin. Three first anterior longitudinal veins of the male elytron bow-shaped. Upper side of the first joint of the male hind tarsus with 6 spinules on the outer, 5 spinules on the inner margin. E. Uzbekistan
4. **C. tshirkunae** sp. n.

1. **Cophaphonus riparius** sp. n.

♀ (holotype). Body of medium size.

Head small; maximum width of the head hardly larger than that of the anterior pronotal margin. Frons rounded, very weakly projecting forwards. Pronotum almost square, very weakly narrowed towards the posterior margin. Elytra very small, scarcely extending beyond the anterior margin of the metanotum; elytron with four thick longitudinal almost straight veins; apex rounded. Hind femora thick; length of the femur almost three times greater than its maximum width. Upper side of the hind tibia with 2 spines on the outer, 4 spines on the inner margin. Upper side of the first joint of the tarsus with 5 spinules on the outer, 4 spinules on the inner margin. Ovipositor very short; its length 0·4 that of the hind femur. General coloration uniform, brownish-yellow. Frons with a regular bow-shaped brownish stripe above the antennae and with a brownish indistinct spot at the inner margins of the antennal cavities; lower part

brownish-yellow. Cheeks brown-yellow. Vertex and occiput with three longitudinal indistinct brownish stripes; median stripe broad, lateral stripes narrow and more distinct than the median one. Pronotum with two triangular indistinct brownish median spots above; lateral lobes brownish-yellow. Inner side of the hind femur with a small brownish pre-apical spot. Abdomen brownish-yellow.

Male unknown.

Length of the body ♀ 15·7; pronotum ♀ 2·8; elytron ♀ 0·8; hind femur ♀ 7·7; ovipositor ♀ 3·2 mm.

U.S.S.R., Western Turkomania, coast of the straits of Kara-bogaz-gol, 1895, 1 ♀ (holotype) (Maximovitsh).

This new species is nearest to *C. privatus*, sp. n., differing from it by the weak armament of the outer margin of the upper side of the female hind-tibia and by the short female ovipositor.

2. **Cophaphonus privatus** sp. n.

Cophaphonus zimini Bey-Bienko, 1933, *Bol. Soc. esp. Hist. Nat.* 33 : 326 (*non* Tarbinskij).

♂ (holotype). Body of medium size.

Head small; maximum width of the head almost equal to that of the anterior pronotal margin. Frons flat. Pronotum almost square, very weakly narrowed towards the posterior margin. Elytra almost reaching the posterior margin of the first abdominal tergite; elytron with six thick longitudinal veins, two anterior veins weakly bow-shaped, four posterior ones almost straight; apex rounded. Hind femora thick; length of the femur 3·2 times its maximum width. Upper side of the hind tibia with 3-4 spines on the outer, 4 spines on the inner margin. Upper side of the first joint of the hind tarsus with six spinules on the outer and on the inner margin.

General coloration brownish-yellow. Frons with a regular bow-shaped brownish-black stripe above the antennae and with a brown spot at the inner margins of the antennal cavities; lower part unicolorous, brownish-yellow. Cheeks with a brown spot behind the eyes. Vertex and occiput with five longitudinal brown stripes; median stripe broad and long, lateral stripes narrower and shorter than the median one. Pronotum with two large transverse triangular blackish median spots and with three blackish indistinct spots at the anterior and posterior margins, median spot triangular. Lateral pronotal lobes with a small blackish spot on the middle and with a larger blackish spot at the middle of the posterior margin; lower margin blackish at the anterior lower angle. Inner side of the hind femur with a brown pre-apical spot. Abdomen brownish, with three black longitudinal stripes above.

♀ (allotype and paratypes). As the male, but larger.

Frons rounded, projecting forwards. Elytra hardly extending beyond the posterior pronotal margin; elytron with six weakly bow-shaped longitudinal thick veins. Length of the hind femur is 2·9–3·0 times its maximum width. Upper side of the hind tibia with 4 spines on the outer, 5 spines on the inner margin. Upper side of the first joint of the hind tarsus with 4-6 spinules on the outer, 5-6 spinules on the inner margin. Ovipositor long; scarcely shorter than the hind femur.

General coloration like the male. Blackish spots at the anterior and posterior pronotal margins sometimes absent. Lateral pronotal lobes sometimes uniformly brownish-yellow. Black longitudinal stripes of the upper abdominal side interrupted.

Length of the body ♂ 13·8, ♀ 15·3–19·7; pronotum ♂ 3·3, ♀ 3·6—4·1; elytron ♂ 2·6, ♀ 0·3–·08; hind femur ♂ 9·1, ♀ 8·3–10·8; ovipositor ♀ 7·1–8·6 mm.

U.S.S.R., Southern Kazakhstan: Kzyl-orda, vi. 1916, 1 ♂ (holotype) (Nikolskij); Kzyl-orda, 2–13, v. 1928, 2 ♀ (Popov); station

Solo-tjube, 60 km. S.W. from Kzyl-orda, vii. 1928, 1 ♀ (Mistshenko).

Recorded by Bey-Bienko (1933) from Solo-tjube, under the name *Cophaphonus zimini* Tarbinskij.

3. **Cophaphonus zimini** Tarbinskij.

Cophaphonus zimini Tarbinskij, 1932, *Bull. Leningrad Inst. Cont. Farm Forest Pests* 2 198, figs. 8–9.

♂. Body of large size.

Head very large ; maximum width of the head is considerably larger than that of the anterior pronotal margin. Frons flat. Pronotum trapezoidal, strongly narrowed towards the posterior margin. Elytra not reaching the posterior margin of the abdominal tergite ; elytron with six thick longitudinal straight veins ; apex rounded. Hind femora thick ; length of the femur 2·9 times its maximum width. Upper side of the hind tibia with 4 spines on the outer, 5 spines on the inner margin. Upper side of the first joint of the hind tarsus with 8 spinules on the outer, 7 spinules on the inner margin.

General coloration brownish-yellow. Frons yellow, with a regular bow-shaped brownish-black stripe above the antennae and with two brownish-black spots at the inner margins of the antennal cavities ; lower part with a brownish-black median spot. Cheeks with a blackish spot behind the eyes. Vertex and occiput with three broad blackish longitudinal stripes which are united in the posterior part of the occiput. Pronotum with few blackish spots above ; some spots united and forming two lateral angular longitudinal stripes, stripes reaching the anterior and posterior pronotal margins ; posterior pronotal margin with a brown small spot at the middle. Lateral pronotal lobes with a distinct blackish longitudinal stripe in the posterior part. Inner side of the hind femur with a brown pre-apical spot. Abdomen brownish above, with three black longitudinal stripes.

♀. As the male, but larger.

Frons rounded, projecting forwards. Elytra hardly extending beyond the posterior pronotal margin ; elytron with six bow-shaped longitudinal thick veins. Length of the hind femur 2·8 times its maximum width. Upper side of the first joint of the hind tarsus with 6-7 spinules on the outer, 6 spinules on the inner margin. Ovipositor long ; its length is 0·6 that of the hind femur. Coloration like the male. Inner margin of the antennal cavities with one brownish-black spot. Lower part of the frons without brownish-black median spot. Vertex and occiput with 5 brown longitudinal stripes ; median stripe broad and long, interrupted in the posterior part by the bow-shaped transverse yellow stripe ; lateral stripes narrower and shorter than the median one. Lateral pronotal lobes with a brownish spot at the middle or at the posterior margin. Abdomen with a blackish longitudinal median stripe above.

Length of the body ♂ 16·4, ♀ 17·5–18·0 ; pronotum ♂ 3·6, ♀ 3·8–4·0 ; elytron ♂ 2·6, ♀ 0·9 ; hind femur ♂ 11·0, ♀ 10·0–11·0 ; ovipositor ♀ 6·4–7·0 mm.

U.S.S.R., Central Uzbekistan.

Specimens examined : 1 ♂ and 1 ♀ (types).

Central Uzbekistan : village Jargak near Chatyrtski, 7. v. 1928, 1 ♂ (Zimin); village Kumak, Katta—Kurgan district, 26. vi. 1929, 1 ♀ (Zimin).

4. **Cophaphonus tshirkunae** sp. n.

♂ (holotype). Body of large size.

Head very large ; maximum width of the head considerably larger than that of the anterior pronotal margin. Frons flat. Pronotum trapezoidal, strongly narrowed towards the posterior margin. Elytra not reaching the posterior margin of the first abdominal tergite ; elytron with seven thick longitudinal veins, three anterior veins distinctly bow-

shaped, three following ones very weakly bow-shaped, the last posterior one almost straight ; apex rounded. Hind femora thick ; length of the femur is 2·8 times its maximum width. Upper side of the hind tibia with 4 spines on the outer, 5 spines on the inner margin. Upper side of the first joint of the hind tarsus with 6 spinules on the outer, 5 spinules on the inner margin.

General coloration brownish-yellow. Frons yellow, with a regular bow-shaped brownish-black stripe above the antennae, stripe reaching the inner margins of the antennal cavities ; lower part with a very indistinct brownish median spot. Cheeks with a blackish spot behind the eyes. Vertex and occiput with three broad blackish longitudinal stripes ; lateral extreme stripes broader than the median one. Pronotum with blackish spots above ; spots almost forming one angular transverse large spot, this spot reaching the anterior and posterior pronotal margins ; posterior pronotal margin with a small blackish spot at the middle. Lateral pronotal lobes with a blackish spot at the anterior margin. Inner side of tergites with femur with a brown pre-apical spot. Abdomen black-brown above ; anterior tergites with two yellow longitudinal stripes ; abdominal apex brownish-yellow.

Female unknown.

Length of the body ♂ 20·2 ; pronotum ♂ 4·3 ; elytron ♂ 4·4 ; hind femur ♂ 11·8 mm.

U.S.S.R. : Eastern Uzbekistan, Ferghana valley, village Paulghan, 4. v. 1940, 1 ♂ (holotype) (*Tshirkun*).

This species the author dedicates to Mrs. M. N. Tshirkun, a young investigator of the fauna of Middle Asia.

A NEW *VERMITIGRIS* (DIPTERA : RHAGIONIDAE) FROM BORNEO

By H. Oldroyd, M.A., F.R.E.S.

Some years ago Mr. H. M. Pendlebury sent me a collection of Rhagionidae from Malaya and Borneo, among which was a single male of the genus *Vermitigris* Wheeler. The war interrupted the working out of the collection, and the death of Mr. Pendlebury following his release from internment makes it unlikely that more information will be forthcoming about this interesting specimen. In view of the rarity of the genus I propose to place it on record forthwith.

Wheeler (1931) devoted a whole volume to a detailed account of the biology of the "ant-lions" (Neuroptera : Myrmeleonidae) and the "worm-lions" (Diptera : Rhagionidae), the larvae of which share the curious habit of making a conical pit in the dust or sand, and feeding upon such prey as may fall into it. Both have been known to European naturalists for centuries ; indeed Wheeler finds a possible reference to the ant-lion in the Book of Job.

The worm-lion was known from the European species, *Vermileo vermileo* L., discovered in the early eighteenth century. In 1907 Comstock found *Vermileo* larvae in Nevada, and there are now six known New World species (Pechuman, 1938). The only other species is *V. niloticus* Edwards from the Sudan.

A second genus of similar larval habits is *Lampromyia* Macquart, known only from S. Africa and the western Mediterranean, extending into Spain. It is distinguished from *Vermileo*, *inter alia*, by its very long proboscis, which led early naturalists to assign it to the Empididae.

A third genus, *Vermitigris*, is known from the following material :—

(*a*) A number of larvae and pupae from Mt. Penrissen, Sarawak, recorded by Shelford (1900), who did not succeed in rearing them. He says : "Some Leptid flies I obtained on Penrissen are, however, I am sure, the adult stage", but gives no description of the adults, nor any record of where they are preserved.

(*b*) A larva and a pupa from Kondi, N. Sumatra, collected by Fairchild and taken alive to the United States, but which did not reach the adult stage. Wheeler considered them sufficiently distinct to justify erecting a new genus on the immature stages alone.

(*c*) A number of specimens bred by the late Mr. H. M. Pendlebury, and described by Brunetti (1927) as *Lampromyia orientalis*. Edwards (1932) examined a puparium of one of these and transferred the species to *Vermitigris*, of which he gave the first description of the adult. The locality was Batu Caves, near Kuala Lumpur, and Bukit Kutu (3000 feet), Selangor. The British Museum has one further specimen from near Petaling, F.M.S. (A. R. Sanderson), and one from Naraikkadu, Tinnevelly Dt., S. India, 12th March, 1936 (B. M.-C. M. Exped.). The puparium is specifically distinct from that of *V. fairchildi* Wheeler.

The single male now before me is from Sandakan, N. Borneo, and is specifically distinct from *orientalis* Brunetti. In view of the locality it might be the adult of Shelford's species, which was not named, but which Wheeler placed on record as "probably *fairchildi*." We have thus two possibilities: (1) this male may be the adult of Shelford's species, (2) Shelford's species may be the same as *fairchildi* Wheeler.

Neither of these points can be settled until larvae are collected and bred. In the meantime I think this species should be named.

Vermitigris.

Vermitigris Wheeler, 1931, *Demons of the Dust:* 274.
Type: *fairchildi* Wheeler, monotypic.

Vermitigris infasciatus sp. n.

♂. Differs from *V. orientalis* Brunetti—of which the type is in the British Museum—as follows:—

Head: Antennae dark, third segment black, first two segments blackish-red. *Thorax*: generally darker, especially the pleura, which are entirely black, with a little white tomentum. In *orientalis* only the mesopleuron is black, the rest extensively yellowish. *Abdomen:* first segment black, the rest warm brown. Second segment has yellowish lateral patches, which extend as light longitudinal stripes as far back as fifth segment. No trace of light and dark rings, so conspicuous in *orientalis*. Hairs brown, and uniformly distributed. *Legs:* similar to those of *orientalis*, except that the coxae and hind femora are uniformly dark brown. *Wings:* with venation characteristic of the genus, but with fore-border heavily coloured brown, and with a brown patch at the tip of the first basal cell.

Length of body 11 mm.; wing 9 mm.

N. Borneo: 1 ♂ Bettotan, near Sandakan, 18th August, 1927 (*C. B. Kloss and H. M. Pendlebury*).

Some of the characters mentioned above are clearly subject to individual variation, as other specimens of *orientalis* have dark coxae and a brown costal border to the wing, and more brown on the hind femora. The dark antennae, *completely* dark hind femora, and the unbanded abdomen mark this species as distinct.

REFERENCES.

Brunetti, E. A., 1927, Notes on Malayan Diptera with descriptions of new species. *J.F.M.S. Mus.* **13**: 13–14.

Edwards, F. W., 1932, Notes on the genus *Vermitigris* Wheeler (Diptera: Rhagionidae). *Stylops* **1**: 217–220.

Pechuman, L. L., 1938, A synopsis of the New World species of *Vermileo* (Diptera: Rhagionidae). *Bull. Brooklyn ent. Soc.* **33**: 84–89.

Shelford, R. S., 1900, On a remarkable Dipterous larva. *J. Straits Br. Asiat. Soc.*, **1900**: 33.

Wheeler, W. M., 1931, *Demons of the Dust.* London.

DESCRIPTIONS OF TWO NEW SPECIES OF ORTHOPTERA FROM CENTRAL ASIA

By G. Bey-Bienko, D.Sc.
(*Leningrad*)

The present paper contains descriptions of two new species of Orthoptera, discovered in Central Asia, the types of which will be deposited in the Zoological Institute of the Academy of Sciences of U.S.S.R.

Tettigoniidae.

Eumetrioptera monochroma sp. n. (Figs. 1-2).

Related to *Eumetrioptera pavlovskyi* Miram from the Hissar range and *Alticolana alticola* (Tarbinsky) from Ferghana but differs in the body coloration and in more reduced elytra.

Size relatively small, form robust. Pronotum with lateral edges rounded, roundly-convex above, median keel completely absent; lateral lobes with hind margin strongly oblique, in ♂ practically straight, in ♀ feebly concave. Elytra strongly reduced, scarcely projecting beyond the pronotum, not or scarcely reaching the hind margin of the first abdominal tergite, but not lateral, even in the female sex. Last abdominal tergite in ♂ with profound concavity; cerci relatively thick, strongly hirsute, reaching the apex of the subgenital plate, straight, conical, with a small, slightly incurved inner tooth placed just at the apex; subgenital plate with not very profound triangular excision; styli relatively small. Female 7th abdominal sternite moderately enlarged, convex, with two moderately developed tubercles at the hind margin; subgenital plate with roundly excised hind margin and small rounded lateral lobes, the disc of the plate with a feeble longitudinal furrow. Ovipositor regularly curved, broad, compressed, somewhat longer than pronotum. Hind femora short, thick, about two and a half times as long as pronotum; hind tibiae thin at the knee, then high and strongly compressed laterally; plantula of hind tarsi short, not reaching the middle of the metatarsus.

General coloration uniformly yellowish-brown, head sometimes indistinctly marmorated with brown, pronotum with lateral lobes unicolorous, without any trace of a pale border, basal part of the male last abdominal tergite and preapical tooth on the cerci blackish; ovipositor brown throughout.

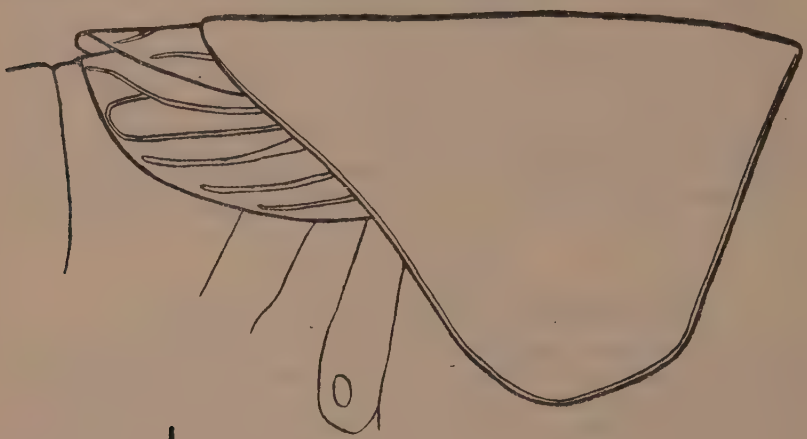
Length of body ♂ 22·5, ♀ 18–22; pronotum ♂ 6·7, ♀ 6.4–7; elytra ♂1·8, ♀ 1·5–2·2; hind femora ♂ 16·2, ♀ 16·5–18; ovipositor ♀ 8·5–9 mm.

Mountains Ak-tash, near Tashkent, Uzbekistan, 25. viii. 1924, 1 ♀ (type); district Tashkent, 16. vii. 1921, 1 ♂ and 1 ♀.

The *Platycleis-Metrioptera* complex to which the genus *Eumetrioptera* Miram belongs was recently studied by Dr. Zeuner (1941, *Trans. R. ent. Soc. Lond.* **91** : 1–50). This complex was divided by Zeuner into 16 genera based on the features of the female sex alone; thus, the determination of the genera is impossible on male specimens.

Dr. Zeuner's study represents an undoubtedly interesting and useful work, but it is only the first step in the classification of this difficult complex of genera. To my mind a re-examination of his generic divisions is necessary, and it is very probable that some of Zeuner's genera must be broadened or treated only as subgenera. For instance, the monotypic

genus *Alticolana* Zeuner represents probably a synonym of *Eumetrioptera* Miram ; *Eu. monochroma* sp. n. may be equally well included in either of these genera, but I prefer *Eumetrioptera* as the older name.



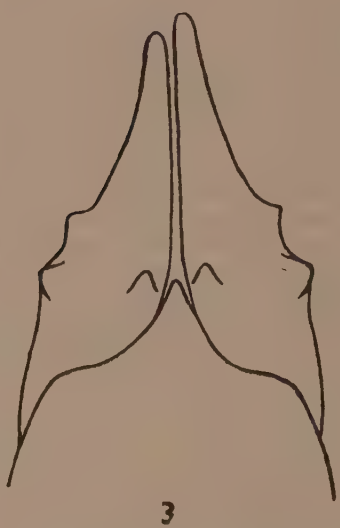


Fig. 1.—*Eumetrioptera monochroma* sp. n. ♂. Pronotum and elytra, lateral view.
Fig. 2.—*Eumetrioptera monochroma* sp. n. ♂. Right cercus.
Fig. 3.—*Paedomastax hissarica* sp. n. ♀. Lower valvae of the ovipositor and apex of the subgenital plate, ventral view.

Acrididae.

Paedomastax hissarica sp. n. (Fig. 3).

♀. Relatively slender, feebly rugulose. Head small, smooth ; frontal ridge broadened from the median ocellus to the vertex, sinuate but subparallel below the ocellus ; vertex convex, roundly passing into the frontal ridge, median keel feeble but distinct on the vertex and occiput. Antennae short, 23-jointed, scarcely longer than anterior femora, very

indistinctly clavate apically. Pronotum feebly rugulose, not punctured, transverse sulcus completely absent on the disc, but distinct on the lateral lobes, median keel well developed ; anterior margin practically straight, hind margin straight, but with a feeble median emargination. Meso- and metanotum without lateral keels. Abdomen smooth, supra-anal plate elongated, narrowly triangular, subgenital plate with relatively short, acute median triangular projection, but without distinct lateral projections ; upper valvae of the ovipositor practically straight, with 7-8 small teeth on the outer side, lower valvae with three basal teeth, of which two are external and one is placed at the base of the inner side. Hind femora relatively slender, about five times as long as their maximum width, without spines on all upper keels, but inner and upper keels armed with a small apical spinule, anterior and median femora unarmed on the apex ; hind tibiae with 19 outer and 16 longer inner spines ; tarsal claws relatively long, arolia small, not longer than half the length of each claw.

♂. Smaller and more slender. Head with frontal ridge quite parallel-sided below median ocellus. (Antennae broken off.) Hind margin of the pronotum straight, without median emargination. Abdomen slender, curved apically ; cerci relatively short, moderately narrowing apically, with immediate apex rounded ; subgenital plate relatively short, conical. Hind femora about six times as long as their maximum width, hind tibiae with 22 outer and 18 longer inner spines.

General coloration brownish-grey, anterior and median femora and tibiae in female with three blackish rings, hind femora with four not sharp blackish fasciae on the upper side ; legs in male without distinct rings or fasciae, but upper side of hind femora darkened ; lower side of hind femora dirty greyish-yellow in both sexes, hind tibiae greyish-yellow.

Length of body : ♂ 13, ♀ 19·5 ; pronotum ♂ 1·8, ♀ 2·2 ; hind femora ♂ 9·8, ♀ 11 mm.

Sources of the River Tshash-sai, Hissar range, S. Uzbekistan, 15. ix, 1929, 1 ♀ (type) and 1 ♂ (*E. Kuznetzova*).

Although this new species belongs formally to the genus *Paedomastax* C. Bolívar, it is characterized by some features of the related genus *Gomphomastax* Brunner-Watt. In the structure of antennae, tarsi and the female ovipositor the new species comes rather near my *Gomphomastax robusta* described from Transilian Alatau (Bey-Bienko, 1936, *Ann. Mag. nat. Hist.* (10) **18** : 305–307), but differs in the armament of the legs and in some other features.

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1947

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" April 2

" May 7

" June 4

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